QBM IoT Gateway

QBM IoT GATEWAY

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QBM IoT Gateway
Quick installation guide

In any project, it is possible to install unlimited number of gateways respecting the following rules

- 1 gateway
- 50 zone
- 200 nodes

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This manual provides clear instructions for using and setting up the QBM IoT Gateway. Suitable for lighting professionals, installers, and system administrators, it guides you through commissioning your device via the web interface and connecting to the Bluetooth mesh network.

While efforts have been made to ensure accuracy, INVENTRONICS is not liable for errors or changes.

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Important

In any project, an unlimited number of gateways can be installed, provided the following rules are observed. In each area, it is possible to install:

- 1 gateway
- 50 zones
- 200 nodes

Terminology

QBM

Quality Bluetooth Mesh.

BT

Bluetooth.

EL

Emergency Lighting.

UID

Unique Identifier.

Provisioning

The process of joining a Bluetooth node to a Bluetooth mesh network, making the node an active device able to interact with the other devices according to the models implemented. Provisioning and un-provisioning are done by means of HubSense Commissioning mobile app.

The QBM IoT Gateway can be provisioned using the mobile app even before the gateway gains internet access (e.g., when the Ethernet cable is disconnected).

Commissioning

The QBM IoT Gateway retrieves essential Bluetooth mesh network data, including keys, nodes, elements, models, and profiles. Commissioning needs an internet connection to access cloud data and must be repeated after any mesh configuration changes, like adding or removing nodes.

1. Introduction

This document outlines the basic instructions for setting up the QBM IoT Gateway in a Bluetooth (BT) mesh network. For clarity, the QBM IoT Gateway will be referred to as "the gateway."

2. Setup

2.1 Network

Connect the gateway to an internet-enabled network and power it on. After about 10 seconds, the gateway attempts to connect to the cloud. A successful connection causes the red LED to blink 30 ms on, 200 ms off; a failed connection blinks 1 second on, 3 seconds off. See the LEDs and Button section for more details.

By default, the gateway operates in DHCP mode, meaning it automatically obtains an IP address from the local DHCP server after powering up.

Important note:

- the gateway connects to the cloud over port 443. For Europe, the endpoint is: *"a26dva076fyeit-ats.iot.eu-central-1.amazonaws.com"*.

- the gateway periodically queries an NTP server (pool.ntp.org) over port 123.

To ensure a successful connection, the user should verify preliminary with the IT department that there are no restrictions in place, such as firewalls, port blocks, etc.

2.2 IP address retrieval

To access the web server, obtain the gateway's assigned IP address using one of these methods:

- Check the connected devices list on your router's setup page.
- Run an IP scanning tool like *Advanced IP Scanner*.
- Ask your IT department for the gateway's IP.
- If already activated, check the device status with the *HubSense Cloud API*.

Connect the QBM IoT Gateway and the computer switch Ethernet.

2.3 Provisioning

First, make sure you have created a valid project on the *HubSense Web App* at
https://platform.hubsense.eu/

Next, use the *HubSense Commissioning Tool* mobile app to provision the gateway by adding it to a zone within your project. Download the app here: https://www.inventronics-light.com/hubsense#commissioning_app

2.3.1 Restrictions

Project setup limitation:

- Limit of **1** gateway per area and 1 area per gateway.
- Each gateway supports up to **200** nodes (excluding itself).
- Each gateway manages a maximum of **50** zones.

2.4 Commissioning

After the gateway is provisioned (see the previous section), the commissioning process may be initiated. During commissioning, required data is transferred from the cloud to the gateway so that it can function within the Bluetooth Mesh (BT Mesh) network. This procedure is conducted through the gateway's web server, as outlined in the following section.

Important note:

Once commissioned, the gateway is dedicated to its assigned project. Switching it to another project requires Inventronics support to properly decommission and reconfigure it, ensuring security and system integrity. Any mesh network changes (like node removal or provisioning) require recommissioning of the gateway.

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3 Web server

The web server serves as an interface for executing key operations and accessing a range of gateway functionalities, including commissioning, IP configuration, data retrieval, and additional features.

Important note:

- The web server is accessible only from the local network, requiring the user's PC to be on the same subnet as the gateway (usually with a subnet mask of 255.255.255.0), meaning both IP addresses share the first three segments (e.g., 192.168.101.x).
- Remote access to the gateway's web server requires a VPN connection.
- To use the web interface, first locate the gateway's IP address as detailed above.

3.1 Login page

To access the web server login, enter the gateway's IP address in your browser (Edge or Chrome recommended). The login page will appear.
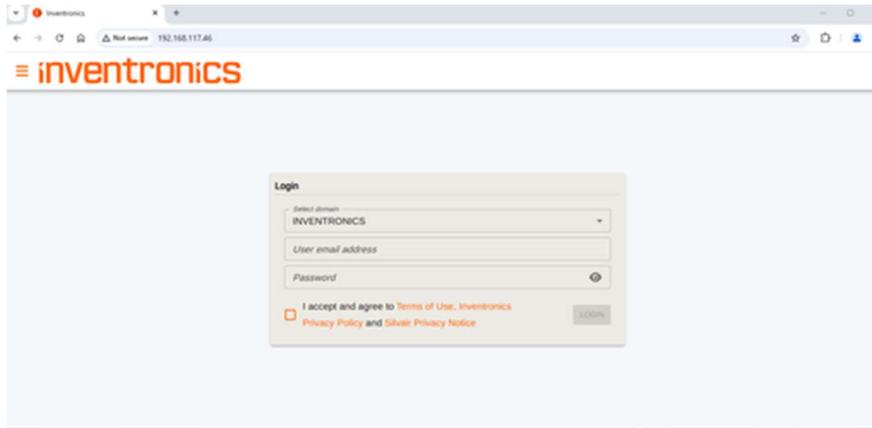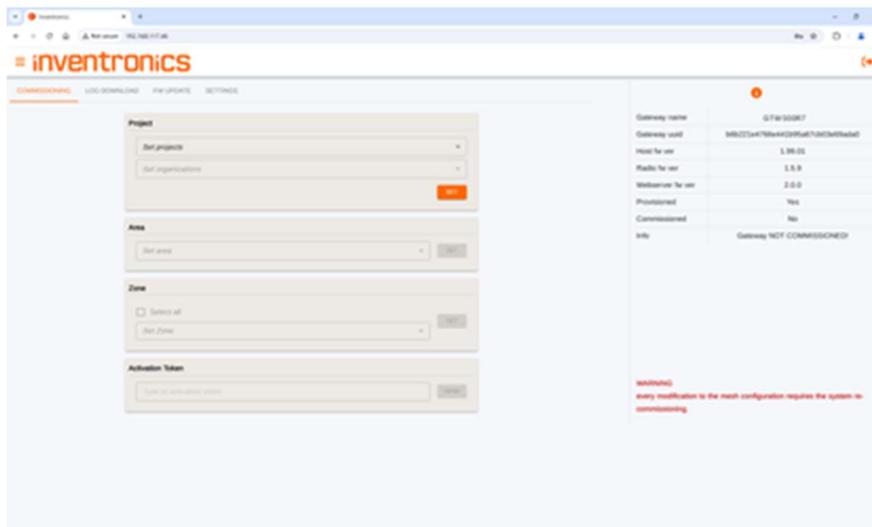

To log in to the HubSense Commissioning Tool:

- Select the project's domain.
- Enter your provided *User Name* and *Password*.
- Review the *Terms of Use* and *Privacy Policies*, check the box, and click *LOGIN*.

Credentials are not stored on the gateway; they're used only for cloud access and data download.

The *Commissioning* tab will appear after a few seconds:



In the example above, the right panel shows:

- The gateway's name.
- Provisioned status: *Yes* (successfully added to a BT mesh network with the *HubSense Commissioning Tool* app).
- Commissioned status: *No* (missing network details like node count and implemented models).

Important note: If the page won't open, try clearing your cache, reloading with Shift + F5, or using InPrivate (Edge) or Incognito (Chrome) mode.

3.2 Commissioning page

The user must follow these steps:

- **Project:** from the drop-down menu, the user selects the project of interest and the organization. During the first commissioning (gateway activation), the user can choose an organization from the proposed list or create a new one as in the pic below. After the first activation, the organization is assigned to the project, and this assignment cannot be modified.
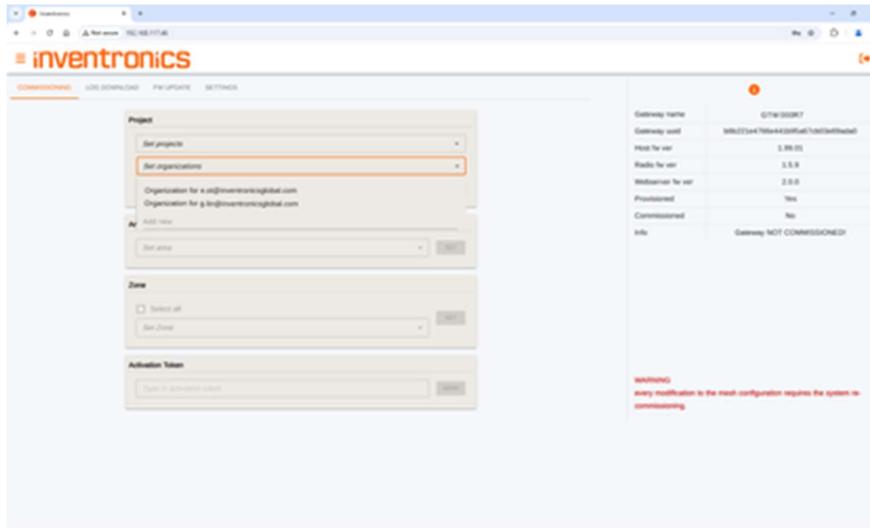
- **Area:** The user chooses the desired area from the drop-down menu. Only **one** gateway may be installed in each area.
- **Zone:** Users select one or more zones of interest. According to the *Restrictions* section above, a maximum of 50 zones can be selected. Data from devices in zones not selected will not be processed by the gateway.
- **Activation Token:** The activation token provided with the gateway must be entered and submitted.

After a few seconds, a message will appear confirming that the gateway has been commissioned. The information on the right panel will update, and the commissioning status will change to *Yes*.

In case of successful commissioning, the red LED will begin blinking twice, with a pattern of 30 ms on and then 1 second off.

Important note: If an error occurs during commissioning, wait at least 1 minute before retrying. This cloud-imposed limit helps control access. For ongoing issues, reload the page.

Common failure causes:

- Wrong credentials.

- Connection drop. If the internet connection is lost, the gateway is not able to reach the cloud.

- Wrong activation token.

- Gateway already commissioned on a different project.

- Timeout. The commissioning process resets and returns to the login page if the user takes longer than 5 minutes to complete any step.

3.3 Log Download page

From the *Log Download* page, the user can download data in CSV format for the following:

- **Data:** this includes time-streamed **Energy** and/or **Presence detection** data. The gateway retains this data for a maximum of 1 week. The user can specify the timespan for the data to download.

- **Alarms:** this provides a snapshot of the last known alarm status of the system stored on the gateway. The user cannot specify a timespan for this data. Please refer to the Appendix for the list of alarms.

- **ELT (Functional and/or Duration Test Reports):** these are test reports collected by the gateway. The data is stored incrementally, meaning that if there are no variations in the test reports, the last known report is kept. EL test reports are collected daily, and a maximum of 1 week of EL test data can be returned. The user can specify the timespan for this data to download.
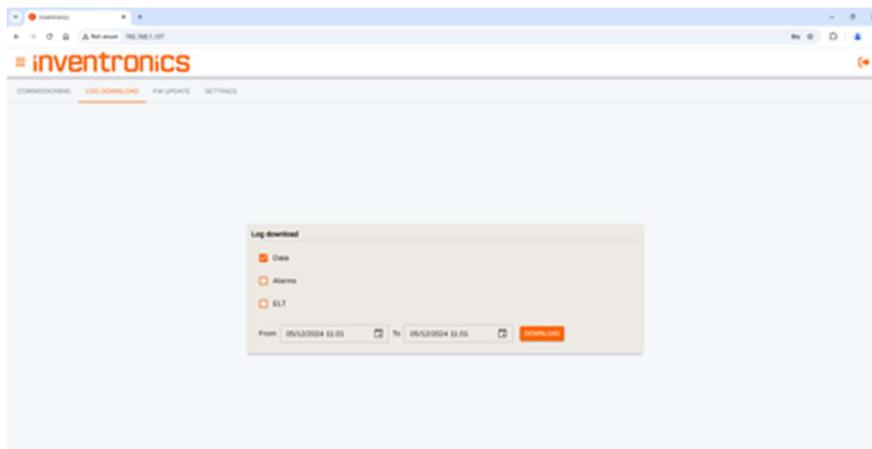
3.4 Fw Update page

From this page, the user can update the gateway. The necessary files are provided by *Inventronics*. Any files that are not recognized will be discarded.
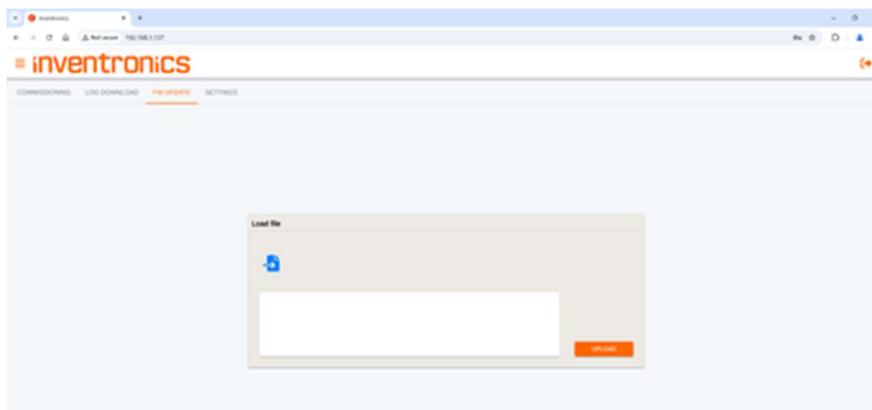

3.5 Settings page

This page allows the user to change some system parameters:

- **IP Addressing:** DHCP is enabled by default. Changing IP settings causes the gateway to reboot, requiring users to wait and log in again for web server access.

- **Time zone:** The time zone is displayed and can be adjusted using the *HubSense Web App*.

FW Update: The *Enable automatic updates* option is selected by default but can be turned off. The gateway checks weekly for firmware updates or can update immediately if the user clicks *FORCE UPDATE*.

- **SYSTEM:** a system reset can be triggered by selecting this option.
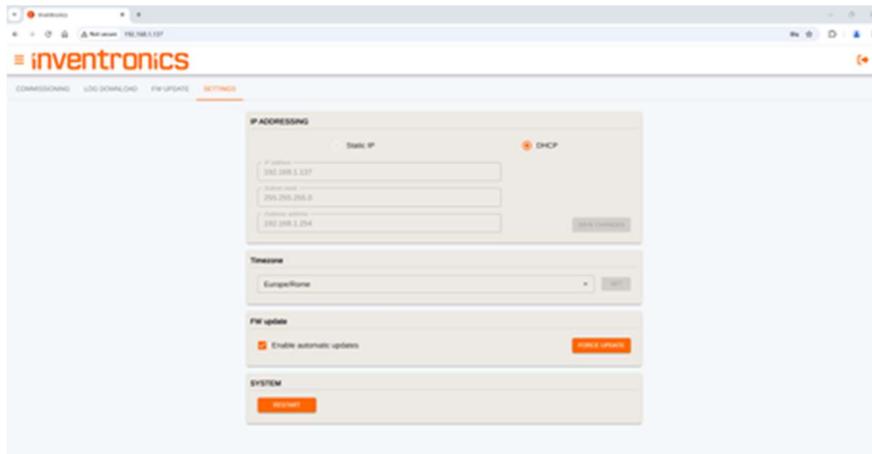
4 LEDs and Button

The tables below summarize the meaning of the LEDs' signals.

Green LED	Signal
Node Attention command	0.5s ON, 0.5s OFF
Node is provisioned	1 blink 30ms ON, 2s OFF
Node is un-provisioned	1 blink 30ms ON, 0.3s OFF
Ping reply is missing from radio module	ON
Red LED	**Signal**
Fault condition	ON
Cloud connection NOT established with gateway NOT commissioned.	1 blink 1s ON, 3s OFF
Cloud connection established with gateway NOT commissioned	1 blink 30ms ON, 0.2s OFF
Cloud connection NOT established with gateway commissioned	1 blink 30ms ON, 1s OFF
Cloud connection established with gateway commissioned	2 blinks 30ms ON, 1s OFF

The following table explains the button functionalities.

Function	Action	Wait for	Confirm	Confirmed
System reset	Long push 5s	None	None	None
Un-provisioning	Long push 10s	Green LED ON	2 short pushes within 10s	None
Factory reset	Long push 20s	Red&green LEDs ON	2 short pushes within 10s	Red&green LEDs 1s OFF, 1s ON

5 Fault condition

If the Ethernet cable is unplugged or no valid IP address is assigned at power-up, both green and red LEDs stay on. Pressing the button in this state turns both LEDs off; each additional press switches them back on.

6 Appendix

6.1 Alarms list

	Alarm text	Description
1	*BattLow*	The battery low error.
2	*SupplyVLow*	Supply voltage too low error.
3	*SupplyVHigh*	Supply voltage too high error.
4	*PwrInt*	Power supply interrupted error.
5	*NoLoad*	No load error.
6	*OverLoad*	Overload error.
7	*OverHeat*	Overheat error.
8	*InputLow*	Input too low error.
9	*InputHigh*	Input too high error.
10	*InternalBus*	Internal bus error.
11	*TimeSync*	Time synchronization error.
12	*RTC*	RTS error.
13	*ControlGear*	DALI control gear error.
14	*Lamp*	Lamp error detected by DALI control gear.
15	*DALILimit*	DALI direct arc power value error (DALI Min; DALI Max).
16	*DALINoResp*	Control gear do not respond to five consecutive queries.
17	*DALISystem*	DALI bus low for at least the system failure time.
18	*NodeAlive*	No activity detected from the node for longer than 24 hours.
19	*EltFunc*	EL functional test error.
20	*EltDur*	EL duration test error.

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